

## Indonesia LNG Snapshot

Startup Original/ Add-On	Original Capacity		Add-On Capacity (1) (2)		Total Working Capacity 2002 (MTA) (3)
	Nameplate (MTA)	Working (MTA)	Nameplate (MTA)	Working (MTA)	
<b>Bontang:</b> 1977 original/new trains: - 2/1983; - 1/1989; - 1/1993; - 1/1997; - 1/2000	'A-B' – 2 x 2.15	2 x 2 .60	'C-D' - 2 x 2.15 'E-F'- 2 x 2.30; 'G'-2.60 'H'- 3.00	17.6 ( 'C-D' – 2 x 2.3; 'E-F'-2 x 2.5; 'G'-2.9, 'H'- 3.3) Trains 'A-B' debottleneck to 3.2 each	22.2
<b>Aceh:</b> 1978 – 3 original/new trains - 2/1983-4 - 1/1986	3 x 1.50	3 x 1.70	3 x 1.50	# 1-3 Debottleneck increases each train to 2.9 #4-6: Debottleneck – increases each train to 3.5 Train Closures 4/2001: #2 mothballed cuts 2.9; #6 mothballed cuts 3.50	12.8
<b>TOTAL</b>					<b>35.0</b>
2P Reserves		Production (Export)			
Gas (TCF) (4)	Condensate (million BBLs) (5)	Gas (million CF/day) (6)	Condensate (MBD) (7)	Major Production Fields (8)	
National: 134.1 Bontang: 24..8 Arun: 5.6	620 345 30	6,804 2,841 694; (3,381)	108 78 12 (54)	Bontang: Sanga Sanga, Offshore Mahakam, East Kalimantan PSCs (includes Badak, Nilam, Tunu, Tambora, Sisi, Nubi, NW Peciko, Semanlu gas fields and associated gas from Handil, Attaka, Bekapai); Arun: North Sumatra 'B' Block (single, giant gas field), NSO Block – (A, J1, J2 gas fields)	
<b>Initial Cost</b>	Roughly \$1.2-1.5 billion each for Bontang and Aceh on two trains and three trains, respectively. Further LNG investment since 1980 more than \$10 billion.				
<b>Ownership Upstream</b>	Bontang supplied by Offshore Mahakam PSC (50% Total, 50% Inpex), Sanga Sanga PSC (23.13% Vico, 26.25% ENI (ex-Lasmo), 26.25% BP, 20% CPC Taiwan, 4.37% Universe Gas and Oil (Osaka Gas) and East Kalimantan PSC (100% Unocal). Aceh 100% ExxonMobil North Sumatra PSC (of which Pertamina takes 70% of output)				
<b>Ownership Downstream (9)</b>	P.T. Badak NGL Co. at Bontang (55% Pertamina, 20% Vico, 15% Japan Indonesia LNG Co.); P.T. Arun NGL Co. at Aceh (55% Pertamina, 30% ExxonMobil and 15% Japan Indonesia LNG Co.				
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## Indonesia LNG Snapshot (CONT'D)

<b>Term LNG Contract Volumes/Customers</b>	<u>Japan</u> : Kansai Electric 3.45 MTA, Chubu Electric 3.8 MTA, Kyushu Electric 1.56 MTA, Osaka Gas 3.11 MTA, Toho Gas 0.91 MTA, Nippon Steel 0.65 MTA, Tokyo Electric 0.51 MTA, Tohoku Electric 3.00 MTA, Tokyo Gas 0.92 MTA, Hiroshima Gas 0.23 MTA, Nippon Gas 0.08 MTA; <u>S. Korea</u> : Kogas 5.3 MTA; <u>Taiwan</u> : CPC 3.41 MTA. Short-term contracts and spot sales in 2002 resulted in 0.11 MTA of additional sales.
<b>Basics of Term Contracts</b>	Wide range of contracts, CIF and FOB, generally based on Japan crude oil BTU linkage, as well as index to Indonesian spot crude values, as based on the Indonesian Crude Price Index (ICP); S-curve adjustment, shipping cost factor, take or pay terms rescinded. In late 1990s began sales on shorter-length contracts, and is considering 'one-off' or very short length contract sales.
<b>Term Loading Port</b>	Bontang (Kalimantan/Borneo) and Arun (Aceh/Sumatra)
<b>Term Discharge Ports</b>	<u>Japan</u> : Terminals Senboku, Himeiji, Chita, Tobata, Shin-Oita, Higashi-Ogishima, Higashi-Niigata, Sodegaura, Hatsukaichi, Kagoshima, Chita, Yokkaichi, Fukuoka; <u>S. Korea</u> : Pyeong-Taek; <u>Taiwan</u> : Yung An
<b>Average Transport Time/Distance</b>	<u>Japan</u> : 1.5-2 weeks/2,211-3,265 nautical miles <u>South Korea</u> : 1.5-2 weeks/2,605-3,135 nautical miles <u>Taiwan</u> : 1 week/1,455 nautical miles
<b>Contract Duration/Expiration</b>	Usually 20-25 years

**Notes:** (1) The slow expansion of the Bontang complex has been complicated. Trains 'C-D' were commissioned at 2.15 MTA nameplate each, trains 'E-F' at 2.30 MTA, train 'G' at 2.60 MTA, and train 'H' at 3.0 MTA. Trains 'A-D' were debottlenecked to a capacity of 3.2 MTA each; trains 'E-F' debottlenecked to 2.5 MTA each, train 'G' debottlenecked to 2.7 MTA and the newest train 'H', commissioned in 2000, remains a nameplate 3 MTA. Nameplate capacities stated above are current liquefaction capacity. The future of the proposed 'I' train remains undecided.

(2) A similar story can be told for Aceh. Trains 1-3 were designed at 1.5 MTA each. The second group of trains 3-6 were originally designed at 1.5 MTA, but capacity changed while still under construction and trains were commissioned at 2.5 MTA. Upgrading of first 3 trains in early 1990s increased nameplate to 2.1 MTA each. Further debottlenecking increased capacities further though the capacities stated above for 2002 remain current. In April 2001, trains #2 and #6 were mothballed and a third train may be closed down by 2005.

(3) True working capacity always has been substantially above annual output. In the past, the restraints were a shipping bottleneck and Pertamina's reluctance to sell cargoes on less than long-term contracts. More recent political turmoil has reduced buyer appetite for Indonesian incremental sales. Contracted LNG volumes at Aceh have fallen sharply, due to transfer of sales to Bontang, accidents which have shut down the liquefaction complex and sporadic violence. Aceh shipped only about 6.6 MTA in 2000 and was unable to meet its sales program of 6.3 MTA in 2003. Working capacity stated is for 4 trains, as 2 units were mothballed in early 2001.

(4) While total reserves in 2001 were still officially 134 TCF, many of these fields are far from either LNG complexes or population centers and are in a sense technical, rather than commercial, reserves. Cedigaz estimates of proven reserves have increased marginally in recent years. Commercial estimates of proven reserves are in the range of 72 TCF, much of it associated gas. Yet most of gas volumes are earmarked for the Bontang LNG operation, and all gas fields used for Arun, are non-associated gas fields, and so not linked to the oil field operational needs. East Kalimantan alone is believed to have a further 18.5 TCF of uncommitted gas reserves accessible to the Bontang LNG complex.

(5) Condensate reserve estimates exclude condensate reserves found in oil fields and contained within the general crude oil pool. Bontang's gas fields contain most of the remaining major condensate reserves known in Indonesia; maturation of Arun gas fields leaves less than 30 MBBLs of condensate recoverable.

(6) Production figures for 2002 are marketed output and exports are for clean and dry gas. Breakout of Aceh and Bontang estimated on basis of LNG sales; official statistics still pending. Traditionally more than 70% of Indonesian marketed gas goes to LNG production and exports, but the closure of Arun for nearly half of the year reduced that to almost 60% that year. Gas

production usually is much higher than dry gas exports, due to the loss of gas volume from NGL stripping and gas cleaning.

(7) Our production figures only include condensate produced and sold as such. Indonesian exports declined sharply in 1999-2000, as Jakarta reduced sales as an import substitution measure, but rebounded marginally in 2001-2002. Import substitution has been the primary concern of Pertamina in recent years and this has reduced condensate export avails.

(8) Gas used for Bontang is increasingly shifting to offshore Mahakam, increasing Total's share of sales gas to over 80% of gas supplied through 2010. The Unocal gas reserves at W. Seno/Merah Besar, oil, associated gas and non-associated gas finds made 1999-2000, will become available for additional supply by 2004, but currently remains uncommitted gas.

(9) Japan Indonesia LNG Co., also known as Jilco, is a consortium consisting mainly of Japanese utilities. Jilco shareholders include Kansai Electric 19.3%, Chubu Electric 13.75%, Kyushu Electric 12%, Osaka Gas 10.38%, Toho Gas 2%, Tepco 2%; trading houses Nissho Iwai 10%, a coordinating committee of Mitsui, Mitsubishi, Itochu, Tomen and Marubeni a combined 9.6% ; Nippon Steel holds 4.28% and Far East Oil Trading, a Pertamina affiliate, 6.66%. The remaining 7.49% is shared among a Japanese group of banks. Traditionally it has been the supply of gas to the downstream operation that has been the source of profits in Indonesian LNG. Liquefaction units have been tolling operations. In 2003, Pertamina's ownership and management of existing liquefaction trains was confirmed by the government, but the issue of the ownership and operation of future trains in existing downstream complexes remains pending.